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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/512,336 02/24/00 FUKUDA

S SON-1745

IM22/0301

EXAMINER

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ART UNIT

PAPER NUMBER

1765

DATE MAILED:

03/01/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/512,336

Applicant(s)

FUKUDA, SEIICHI

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. Claims 2, 3, and 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 2 and 7, "fluorine gas has a structure that a ratio of fluorine atoms with respect to elements of the gas molecule except for fluorine" is vague and indefinite because fluorine gas contains only fluorine. The examiner suggests using --fluorine-containing gas—or --gas including fluorine--.

In claims 3 and 8, "fluorine gas has a structure that the total number of fluorine atoms in elements constituting said gas molecule is four or less and a carbon atom is contained" is vague and indefinite for the same reason.

In claim 6 "a mask is formed by silicon oxide or silicon nitride to perform dry etching" is vague and indefinite because it is not clear whether the dry etching is required.

### ***Claim Rejections - 35 USC § 102***

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Ha et al. (US 6,146,542).

In a dry etching method, Ha teaches that tungsten may be dry etched with mixed gas containing fluorine gas, chlorine or hydrogen bromide, oxygen and nitrogen (col. 3, lines 34-65).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ha et al. (US 6,146,542).

In a dry etching method, Ha teaches that tungsten may be dry etched with mixed gas containing fluorine gas, chlorine or hydrogen bromide, oxygen and nitrogen (col. 3, lines 34-65).

As to claims 2 and 3, because Ha is not particular about the fluorine-containing gas in the process, therefore, it would have been obvious to one with ordinary skill in the art to use any conventional fluorine-containing gas such as  $\text{CHF}_3$ ,  $\text{CF}_4$ ,  $\text{CH}_2\text{F}_2$ , or  $\text{CH}_3\text{F}$ .

As to claim 4, in a method of fabricating a semiconductor device, Ha teaches laminating upwards a polycrystal silicon film or an amorphous silicon film, a tungsten nitride film or a titanium nitride film and a tungsten film on a silicon substrate (Col.3, lines 30-39). The tungsten nitride or the titanium nitride and the tungsten film may be

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dry etched with mixed gas containing fluorine-containing gas and chlorine or hydrogen bromide, oxygen and nitrogen (col. 3, lines 40-65).

Ha is not particular about the semiconductor device being fabricated in the dry etching method, therefore, any conventional feature of a semiconductor device such as gate electrode of the instant claim may be formed.

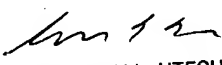
As to claim 5, Ha teaches that the polycrystal silicon film or the amorphous silicon film may be etched with gas, which does not contain fluorine (col.4, lines 25-26).

As to claim 6, Ha teaches that a mask is formed by silicon oxide or silicon nitride.

As to claims 7 and 8, because Ha is not particular about the fluorine-containing gas in the process, therefore, it would have been obvious to one with ordinary skill in the art to use any conventional fluorine-containing gas such as  $\text{CHF}_3$ ,  $\text{CF}_4$ ,  $\text{CH}_2\text{F}_2$ , or  $\text{CH}_3\text{F}$ .

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is 703-3050222.

K-C C  
February 27, 2001

  
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